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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/647,367	08/25/2003	Tsutomu Yoneyama	5405-6	2146
27799	7590	08/15/2005		
COHEN, PONTANI, LIEBERMAN & PAVANE 551 FIFTH AVENUE SUITE 1210 NEW YORK, NY 10176				
			EXAMINER SHAH, MANISH S	
			ART UNIT 2853	PAPER NUMBER

DATE MAILED: 08/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/647,367	Applicant(s) YONEYAMA ET AL.	
	Examiner Manish S. Shah	Art Unit 2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 June 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) 19-21, 26-30 and 32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11, 14-18, 22-25 and 31 is/are rejected.
- 7) ☒ Claim(s) 12 and 13 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-5, 15, 16, 18, 24, 25 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto et al. (# US 6,523,948) in view of Laskin et al. (# US 6,232,361).

With respect to claims 1 and 18, Matsumoto et al. teaches:

- An ink jet recording head (23) that ejects UV curable ink.
- An UV light irradiation section for irradiating the ink (Fig. 19).
- A humidity detecting section (S2, figure: 1) for detecting the humidity around the recording medium.
- A controller (31, figure: 1) for controlling the irradiation of the UV light on the basis of the detected humidity. (See column: 12, line: 25-39, which discusses controlling output of drying units based upon humidity detected by humidity sensor, column: 13, line: 37-59, which discusses control of IR diodes based on humidity and column: 14, line: 39-56, which discusses control of UV light based on humidity.)

With respect to claim 2, the controller generates data for controlling the output of the UV lights, based upon the detected humidity. Matsumoto further discloses that the

amount of irradiation the UV lights may be varied either by changing the intensity of the output or by changing the duty time (operation time). (column: 13, line: 51-55)

With respect to claims 3 and 4, the controller has a conversion table (63).

With respect to claim 5, the controller has a CPU and performs the calculation for determining the desired UV output.

With respect to claims 15 and 16, the light irradiation section irradiates light for a desired amount of time.

With respect to claim 24, the humidity sensor is provided at a distance capable of detecting humidity around the ink in a carrying direction of the recording medium. (Fig. 1 illustrates that the humidity sensor [S2] is disposed downstream of the print head [23])

Matsumoto teaches the claimed invention with the exception of:

- An ink including a cationic curable component.
- A plurality of humidity sensors.

Laskin et al. teaches an UV curable ink containing a cationic polymerizable component. This ink provides the advantages of insensitivity to humidity, low viscosity and low odor. (column: 2, line: 13-16)

It would have been obvious to one of ordinary skill in the ink jet art, at the time the invention was made; to have provides Matsumoto with the UV curable ink of Laskin et al., for the purposes disclosed therein.

With respect to claim 25, Matsumoto teaches providing a humidity sensor. It would have been obvious to one of ordinary skill in the ink jet art at the time the invention was made to have provided a plurality of humidity sensors, since it has been

held that mere duplication of the essential working parts of a device involves only routine skill in the art (St. Regis Paper Co. V. Bemis Co., 193 USPQ 8). In this case, the provision of multiple sensors would allow for a more accurate detection of the humidity, by averaging the humidity measured by multiple sensors.

The steps of the method of claim 31 are rendered obvious in view of the functions of the combination discussed above.

2. Claims 6, 7, 14 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto et al. (# US 6,523,948) and Laskin et al. (# US 6,232,361), as applied to claims 1-5, 15, 16, 18, 24, 25 and 31 above, and further in view of Richmond (# US 4,033,263).

Matsumoto et al. as modified, teaches the claimed invention with the exception of:

- The controller determining whether the calculated irradiation is not lower the maximum limited irradiation by calculating the desired irradiation. (cl. 6)
- The maximum limited irradiation is determined on the basis of electricity consumption of the light irradiation section and irradiation determined on the basis of life span the light irradiation section within irradiation of UV radiation capable of being irradiated to the recording medium without shrinking and distorting the recording medium. (cl. 7)
- The controller raises irradiation to the desired irradiation and determines the desired irradiation time when determining that the desired irradiation calculated based on the detected humidity is lower that the maximum limited irradiation. (cl. 14)

Richmond teaches a web dryer utilizing a UV lamp to cure an UV curable ink. Densitometer sensors are provided to measure the amount of smudging of the printed image. The UV lamp is controlled based upon the output of these sensors. In this way, the output of the UV lamp may be maintained at an optimum level for effective curing, while conserving electric power and increasing the effective life of the lamp by operating the same at reduced power levels when possible. (column: 8, line: 15-48). Thus, in summary, Richmond teaches optimizing the output of the UV lamps based on various factors, such as the cure rate of the ink, power consumption, the temperature at which the medium scorches etc.

It would have been obvious to one of ordinary skill in the ink jet ad, at the time the invention was made, to have provided Matsumoto, as modified, with a controller that determines whether the calculated irradiation is not lower the maximum limited irradiation by calculating the desired irradiation, wherein the maximum limited irradiation is determined on the basis of electricity consumption of the light irradiation section and irradiation determined on the basis of life span the light irradiation section within irradiation of UV radiation capable of being irradiated to the recording medium without shrinking and distorting the recording medium and that raises irradiation to the desired irradiation and determines the desired irradiation time when determining that the desired irradiation calculated based on the detected humidity is lower that the maximum limited irradiation, as suggested by Richmond.

3. Claims 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto et al. (# US 6,523,948), Laskin et al. (# US 6,232,361) and Richmond (# US 4,033,263), as applied to claims 6, 7, 14 and 17 above, and further in view of Conwell et al. (# US 6,350,071).

Matsumoto, as modified, teaches the claimed invention with the exception of the conversion table being determined on the basis of the sensitivity of the ink to the light.

Conwell et al. teaches that it is well known to use different filters or lamps in order to ensure that the wavelength of the light matches the photo initiator chemistry.

It would have been obvious to one of ordinary skill in the ink jet art to have provided the look-up table of Matsumoto, as modified, with information regarding the sensitivity of the ink to the light in order to ensure that the proper wavelength is used for the photo initiator, as taught by Conwell et al.

With regard to claim 10, since the controller of Matsumoto, as modified, stores information controlling the output of the UV light source in a look-up table, it would have been obvious to one of ordinary skill in the ink jet art at the time the invention was made, to have stored the information concerning the energy outputs for the different types of ink in the look-up table.

4. Claims 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto et al. (# US 6,523,948), Laskin et al. (# US 6,232,361) and Richmond (# US 4,033,263), as applied to claims 6, 7, 14 and 17 above, and further in view of Mizoguchi et al. (# US 6,179,418).

Matsumoto, as modified, teaches the claimed invention with the exception of the controller determining the maximum radiation based on the type of recording medium.

Mizoguchi teaches an ink jet printer having a heater (8) that is controlled based upon the type of recording medium that is being used. (col. 4:66-67 and col. 5:1-17). Controlling the output of the heater based on the type of recording medium enables the fixing of the ink to be optimized for the particular recording medium.

It would have been obvious to one of ordinary skill in the ink jet art to have provided to enable the controller of Matsumoto to determine the maximum limited radiation based on the type of recording medium, in order to maximize the curing of the ink for each different type of recording medium, as taught by Mizoguchi.

With regard to claim 11, since the controller of Matsumoto, as modified, stores information controlling the output of the UV light source in a look-up table, it would have been obvious to one of ordinary skill in the ink jet art at the time the invention was made, to have stored the information concerning the energy outputs for the different types of recording media in the look-up table.

5. Claims 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto et al. (# US 6,523,948) and Laskin et al. (# US 6,232,361), as applied to claims 1-5, 15, 16, 18, 24, 25 and 31 above, and further in view of Schmitt (# US 6,280,801).

Matsumoto, as modified, teaches the claimed invention with the exception of an irradiance of 0.1 to 50 mw/cm<sup>2</sup> or 51-3000 mw/cm<sup>2</sup>.



Schmitt teaches UV curing printing ink using an irradiance of 1 to 100 mw/cm<sup>2</sup> (column: 3, line: 46-50). Using an UV curable ink and UV source having this irradiance allows the ink to be cured without producing excess heat. (column: 3, line: 1-3)

It would have been obvious to one of ordinary skill in the ink jet art, at the time the invention was made, to have provided Matsumoto, as modified, with a light irradiation section having an irradiance of 0.1 to 50 mw/cm<sup>2</sup> or 51-3000 mw/cm<sup>2</sup>, as taught by Schmitt, for the curing an ink without excess heat.

***Allowable Subject Matter***

6. Claims 12 & 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The central processing unit of the controller informs of abnormality of at least one of humidity environment condition and a UV light irradiation condition when determining that the desired UV irradiation calculated based on the detected humidity is not lower than the maximum limited UV irradiation.

***Response to Arguments***

7. Applicant's arguments filed 06/15/2005 have been fully considered but they are not persuasive. Applicant argued that the Matsumoto does not irradiate the ejected ink with UV light; control the UV light source based on humidity; and humidity sensor to control the UV light source, which is not persuasive. Matsumoto clearly teaches in column: 14, line: 39-56) irradiate the ejected ink with UV light; control the UV light source based on humidity (figure: 1); and humidity sensor to control the UV light source (figure: 1). So combination of Matsumoto and Laskin et al. reference teaches the claimed invention.

***Conclusion***

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of


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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Manish S. Shah whose telephone number is (571) 272-2152. The examiner can normally be reached on 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D. Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Manish S. Shah  
Primary Examiner  
Art Unit 2853

MSS

8/11/05